Universidade Europeia

LAUREATE INTERNATIONAL UNIVERSITIES

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Coelho das Neves
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Brands and Sustainability. Contributions for an Ecological Take on Brands of the Consumer's Society.

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Tese apresentada ao IADE – UNIVERSIDADE EUROPEIA, para cumprimento dos requisitos necessários à obtenção do grau de Mestre em Design Management realizada sob a orientação científica do Doutor Fernando Oliveira, Professor auxiliar do *IADE*.

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palavras-chave

Design Management; Sustentabilidade; Surf; Marcas.

resumo

Hoje em dia, não é incomum ouvir o termo “alterações climáticas” assim como a opinião em como o mundo está a atravessar uma transformação acelerada e perigosa. Uma das questões sobre este tema é o que as marcas estão a fazer para atrasar esta transformação. Contudo, tem havido um aumento significativo de conhecimento pela parte da sociedade o que tem chamado a atenção de várias marcas, sobre este tema. Cada vez mais pessoas estão preocupadas com as consequências das mudanças climáticas, o que dá oportunidade a novas oportunidades de gerar novas ideias para minimizar a pegada ecológica dos seus produtos, assim como alterar matérias que possam ser prejudiciais para o ambiente.

Esta tese pretende analisar a relação entre o consumo e a sustentabilidade assim como o que está a ser feito para a conscientização para esta questão,

principalmente do ponto de vista da indústria de Surf.

Para o desenvolvimento desta tese, recorreu-se a uma pesquisa qualitativa para agrupar várias estratégias de investigação sobre que marcas de Surf estão actualmente a tomar decisões sustentáveis. É preciso ainda identificar através da revisão de literatura e estudos de caso comparativos, como cada marca está a introduzir o tópico da sustentabilidade nos seus produtos. Uma análise da informação recolhida através da revisão de literatura e dos estudos de caso selecionados assim como uma tabela comparativa entre os casos de estudo e o conteúdo sustentável estudado, são então feitos para se chagar a um resultado.

keywords **Design Management; Sustainability; Surf;**

abstract

In the contemporary world it is not unusual hearing the term Climate Change and to go along with it, the belief that the world of today is in danger of a frightful and imminent transformation.

One of the main hurdles society is encountering at the moment is how much or, how little, brands are doing to offer more environmentally friendly solutions. However, there has been an increase of knowledge about this issue, which has made quite a few brands/companies change their approach when it comes to their finishing products as it will be shown by relevant case studies. More and more people are becoming aware of the urgency in regard to this issue, which gives way to new business opportunities to try to minimize the carbon footprint of their products as well as the harmful materials used. Therefore, this dissertation is intended to analyse the relationship between Surf brands and sustainability as well as what is being done to create awareness to this matter.

In order to carry out this study it is important to conduct a broad qualitative research to cluster various investigation strategies about which surf brands are already executing sustainable methodology to make their products eco-friendlier. It is also important to dissect information through the literature review and use comparative case studies to understand how each brand is approaching the sustainable issue. A data analysis and a table are then conducted through the literature review and the selected case studies in order to reach a conclusive result.

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Chapter I – Introduction

1.1. Introduction

1.1.1. Context and Relevance

The main motive for this study would be the amount of evidence society has been shown in the past few years about Climate Change and all its consequences and yet some people have not quite grasped the reality of it, continuously speeding up its process (Before the Flood, 2016).

Al Gore (An Inconvenient Truth, 2006) believes that it is relevant to investigate the importance of Sustainable Design in the contemporary world as humans are currently in a world that is rapidly suffering major and, quite possibly, detrimental changes.
Current and established surf brands are contributing to minimizing the repercussions of Climate Change with some simple yet notable solutions. Avoiding plastics, producing only the estimated stock needed, minimizing the ink on logos, upcycling and recycling are some important factors that contribute to more environmentally friendly products; however, there is still need to change many aspects of our day-to-day life to make a real impact (Gabardi, C.).

It is paramount to have a well advised understanding of what Climate Change means and especially, how Surf brands can reshape the Design process in order for it to be more sustainably conscious and make more environmentally friendly decisions so their end product will have an even greater impact.
Consequently, this study will show sustainable alternatives Surf brands can adopt to become more environmentally friendly, which sustainable models have been implemented and also how each company can create awareness to their consumers about this issue.

1.1.2. Definition of the study

Design plays a substantial role in society so it is crucial for it to become one of the leading pioneer professions to take an extra and important step in order to minimize the impacts of Climate Change, starting with the Surf industry as it is connected to one of the most endangered ecosystems.

There are many sources of information about the goals of sustainability and yet it is rather a challenge to find literature that can show which path to take in order to achieve those goals.

This dissertation aims to clarify how Design can have a positive impact on Climate Change and also, give insight on how Surf brands are approaching the issue. There will be a deep research on both the benefits and the downsides of those approaches.

1.1.3. Definition of the problematic

Many distinct brands from different areas of expertise can utilize a variety of strategies, methods and tools to have a more sustainable approach when it comes to their end products. However, little research has been conducted to reveal how brands are contributing to an ecofriendly awareness. In order to write this thesis, it is important to give way to the existing and also unanswered problems about the topic at hand.
Accordingly, the main research question would be:
How can surf brands approach the sustainable issue?
To answer this question, a multiple case study approach will be adopted, analysing several surf related brands on what actions these brands are taking to minimize the impacts of Climate Change. Deep analysis of the literature review and all of the theory that entails, will also provide a deeper understanding about the topic and the question at hand.

First, it will be used a comparative study between surf brands so it becomes clear what each brand is focusing on, whether it is clothing, surfboards only, shoes and so forth. Secondly, it is imperative to delve into the industry to explore and analyse how these brands were contributing to the environment whether it be upcycling, recycling or reducing harmful materials and waste.

Thirdly, it is important to determine which harmful materials brands were most interested in changing as well as which sustainable models are being implemented and its criteria. Step number four will reveal what exactly each of these brands were doing and how, as best as could be achieved.

And finally it is necessary to research whether or not these approaches are a positive long-term solution or whether there are paradoxical elements.
It is important to thoroughly investigate aspects of sustainable design that remain unclear to many people.

1.1.4. Aims and Objectives

The aim of this study is to investigate methods and practices of Design Management and its processes to decelerate the contributions and ramifications of Climate Change. As the world population grew, the need for more resources also increased (Attah 2010), causing potentially irreversible damages to the environment such as ice caps melting, flooding, extreme temperatures, drought, extinction of whole ecosystems such as coral reefs and so forth (Chameides & Wang, 2005). It is essential to entirely comprehend the benefits Sustainable Design can bring to both the society and the planet. It is important to have a deep understanding of which materials cannot be fully destroyed, how brands can try and reduce, reuse and recycle those materials and stimulate consumers to discover new ways to approach shopping.

The objective of this thesis would be to identify if Surf brands are already implementing these solutions and which ones still have not fully gotten the knowledge needed to do so as well as what these brands can do to become sustainable businesses.
A deeper research about Sustainable Business Models will be conducted to understand how Surf brands can reach their sustainable goals.

Reducing CO2 emissions is also imperative as those same emissions are rapidly destroying any surfer's playground – the ocean. By surf brands standing up against carbon emissions and plastic, they are joining forces to minimize the impact of Climate Change on the environment.

1.1.5. Hypothesis

Surf brands can follow the right path to sustainability by putting to work different much needed requirements as well as sustainable models.

Chapter II - Literature Review and Case Studies

2.1. Literature Review

2.1.1. Conceptual Framework

Sustainable Design refers to the design process that has an environmentally friendly approach that considers nature resources as part of the process as well as the design of the end product (Elemansy. 2014).

One of the Designer's roles is problem solving; being able to find innovative solutions. Considering the critical problems, the world is facing at this stage, Designers play an important part in providing solutions to the irresponsible consumption of natural resources (Elemansy, 2014). According to Sissel Waage and Robert Adams from *The Guardian* (2014), Design is a natural human behaviour. There is a tendency to create function and order most of the times to fulfil basic needs as well as analyse and solve problems. However, humans have been doing this for the past decades without thinking about how they are impacting the environment or even how they could create something as an extension of it. As the scale of production demand of modern industrial goods has been growing, Designers are required to make decisions and, these decisions have greater global impact than a few centuries ago (Waage & Adams, 2014).

Waage and Adams (2014) give a very explicit example for this problem[1] *"The architect who specifies a particular type of aluminum-framed window for a skyscraper is making a decision not only about cost, appearance, usability, strength and safety, but also about an entire supply chain that provides those windows. This decision reaches out to play a role in shaping demands placed on international mineral and petroleum extraction companies, glassmakers and trucking companies."* There is a ripple effect caused by one decision, that affects industries, communities and eco systems.

Until relatively recently, Designers have been programmed to think almost exclusively about producing aesthetically pleasing products to meet specific needs, cost and

[1] Retrieved from https://www.theguardian.com/sustainable-business/adapting-architecture-design

functionality of their product (Waage & Adams, 2014). In their research, Waage and Adams (2014) have found something quite relevant- in the future, Designers will be re-defined in light of Climate Change; something that society can already see happening in many brands for instance *Adidas* which, in a recent discussion with *The Financial Times,* pledged that in the year 2024, all of their products will be made from recycled plastics (July 2018). Designers will focus on the shifting of ecosystem structures and functions, water scarcity, human rights violation, hunger, among other trending real issues that threaten our communities more and more each day as there is a deeper understanding of impacts of production and the ripple effects mentioned above.

Designers are also about bringing in different sources for collaboration. As an example, Nataly Gattegno in a chat with *World Economic Forum* (2017), talks about how Designers, in collaboration with professionals from different areas of expertise, respond to their take on environmentally related issues.

Visionary individuals and organisations are making strides in design disciplines to adapt theory, techniques and practices to benefit the environment and society. Green design, deep design, eco-design, eco-effectiveness, design for the environment, and biomimicry[2] all suggest ways in which design can work more closely with natural systems (Waage and Adams, 2014). However, this is not as easy as it may seem, there are a few hurdles to overcome in order to make these solutions happen effectively starting from fully integrating social aspects such as, what are the conditions of the workers who are digging up or making this material and input, to assessing trade-offs involved in sustainable design choices, learning about ecologically friendly materials (as well as what to do when comparable price, aesthetics, and durability do not exist today) and, of course, meshing this work within the fast-paced iterative development occurring within the context of a typical industrial design project (Waage and Adams, 2014).

Business owners, especially, need to take these principles into consideration and take matters into our own hands. Waage and Adams finish the article with an important quote[3] by Jerry Garcia of the Grateful Dead: *"Somebody has to do something and it's just incredibly pathetic that it has to be us"*.

[2] Biomimicry involves reproducing nature's forms, processes and systems to design and build products that support and stimulate life (Alchemus Prime, Retrieved, 2018).

[3] Retrieved from https://www.theguardian.com/sustainable-business/adapting-architecture-design

2.1.2. Principles of Sustainable Design

2.1.2.1. Form

The form is the shape of the object and what manipulates most people into thinking it is the main element of the design product. According to Elemansy (2014), prior designing a product's layout, it is important that the designer asks questions. For example: how will the shape of this product affect energy consumption; how will the size affect packaging; what are the transportation cost and how much carbon monoxide (CO2) will it produce?

2.1.2.2. Function and Usability

Function and usability may contribute to the sustainability of a product in an indirect way as it helps consumers use the product in a way that consumes less energy (Elemansy, 2014). Function refers to a set of technical operations whereas usability alludes to how easy it is to use (Spacey, 2017).

2.1.2.3. Cost-Effective Solutions

The cost of sustainable designs plays a great deal of influence for consumers. Consumers have adapted to the idea quantitative and low-cost or qualitative and high-cost regarding products. With this in mind, the Designer is responsible for reducing the end value of the product (Elemansy, 2014).

2.1.2.4. Renewable Resources

According to Elemansy (2014), designers should stop relying on carbon energy and start thinking of products that depend on renewable energy (e.g. solar panels, wind farms). Renewable energies are sources of clean and inexhaustible energy that are becoming more affordable unlike fossil fuels which are costly as stated by the company *Acciona*, retrieved in August 2018. According to this company, there are different types of renewable resources. The most common are perhaps wind energy, solar energy and hydraulic energy. Although there is biomass and biogas where the energy is extracted from organic material; geothermal energy which heats energy from the Earth; tidal energy obtained from the tides; wave energy acquired from Ocean waves; bioethanol which is an organic fuel obtained from fermentation of vegetation, suitable for vehicles; biodiesel which is also suitable for

vehicles but is obtained from vegetal oils as shown in *Acciona*'s website, retrieved in August, 2018.

2.1.2.5. Durable Design Solutions

In order for a product to be considered zero waste it needs to be either durable enough to last a very long time, if not a lifetime, or be fully recycled and transformed into new materials. Depending on these methods, the end products may be recycled more than once thus decreasing the dependence on Earth's resources (Elemansy, 2014).

According to Cushman-Roisin (p.2, 2018), *"we don't design for the sake of designing, we design for a purpose: to meet a need in a new way, in a better way; to achieve a goal; to make a statement"*. Cushman-Roisin also stated a few sustainable Design principles that can add to the ones stated by Elemansy (2014).

More often than not, companies do not pay enough attention to nature to understand how it can teach us to be more ecofriendly. Brands should use nature as a model to understand how it runs on light, how it fits form to function, how nature recycles everything, how nature rewards cooperation, how nature banks on diversity and how it relies on local expertise (Benyus,1996).

2.1.2.6. Nature as Measure

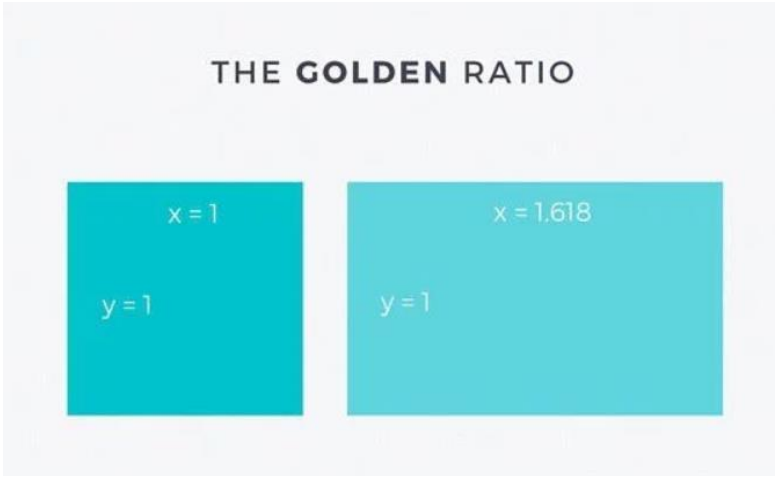
Benyus' research in 1996 (Cushman-Roisin, 2018) has found that nature suggests relative abundances and balances, it also demonstrates achievable rates and shows limits and *The Golden Ratio* shows a few of these examples.

The Golden Ratio is a mathematical ratio that can be seen in nature and when used in Design, it gives way to organic and natural looking compositions that are aesthetically pleasing to the eye (Gross, 2018). This proportion has been used for thousands of years, from the Pyramids of Giza and Da Vinci's Mona Lisa to the Pepsi and Twitter logo.

In order to calculate the Golden Ratio, one side of a rectangle needs to be multiplied by 1.618 to get a harmonious proportionate rectangle – figure 1 (Gross, 2018). Next, lay the square on top of the rectangle and both shapes will form *The Golden Ration* – figure 2 (Gross, 2018).

The Golden Ratio formula can continue to be applied to the new rectangle on the far right, we will eventually get the image in figure 3 (Gross, 2018). An arch can be drawn in each square of the image above, revealing the *Golden Spiral* (Fibonacci Sequence) – figure 4 (Gross, 2018).

As shown in figure 5, clear examples of *The Golden Ratio* applied in nature can be seen. These examples demonstrate beauty and an organic dynamic that can be used as an inspiration for Design products (Gross, 2018).



(From top to bottom)

Figure 1. *The Golden Ratio*. Source: Canva (Retrieved, 2018)

Figure 2. *The Golden Ratio*. Source: Canva (Retrieved, 2018)

Figure 3. *The Golden Ratio*. Source: Canva (Retrieved, 2018)

(From top to bottom)

Figure 4. *The Golden Ratio*. Source: Canva (Retrieved, 2018)

Figure 5. *The Golden Ratio* applied in nature. Source: Canva (Retrieved, 2018)

2.1.2.7. Nature as Mentor

Benyus (1996) offers a few examples of how people should look at nature as a teacher- the *Italian CAMP* pick ax was modelled after a woodpecker - figure 6 (Cushman-Roisin, 2018). The nose of the *Concorde* supersonic plane was designed to be lowered like the head of a swan - figure 7. *Velcro*[4] is a carbon copy of how seeds stick to animal hair - figure 8. Nowadays, *Velcro* is used widely in sneakers, especially for kids as the material makes it easy for them to get their shoes on and off. The synthetic fibre called *Kevlar* that can be found in bullet proof vests was inspired by spider silk - figure 9. *Kevlar* is a liquid which is converted into a fibre and can also be used in fire proof clothing, cut resistant gloves, diving gloves or even car tires (Ryan, 2011).

[4] *Velcro* was created by George de Mestral and patented in 1955. *Velcro* is the name of the company and not the general name for the scratchy fastening system we all know. The name comes from the combination of the name "velvet" and "crochet" (Suddah, 2010).

(From left to right and top to bottom)

Figure 6. Woodpecker and *Italian CAMP* pick ax. Source: Pinterest (Retrieved, 2018)

Figure 7. *Concorde* and swan. Source: Google Images (Retrieved, 2018)

Figure 8. *Velcro*. Source: Seattle Fabrics (2018)

Figure 9. *Kevlar*. Source: Arch Daily (Retrieved, 2018)

During Cushman-Roisin's paper (pg. 5, 2018), a few quotes are suggested to make the reader reflect on the impact nature can really have in our daily lives. One of the quotes indicated is from a rather familiar Greek philosopher – Aristotles (384–322 BC) *"Nature does nothing uselessly"*. Another quote (pg. 5) shown by this paper is one by an extremely versatile and famous person - Leonardo Da Vinci. In this quote (1906) he claims *"Human subtlety will never devise an invention more beautiful, more simple or more direct than does Nature, because in her inventions, nothing is lacking and nothing is superfluous"*. The world has admired his art and discoveries for hundreds of years, some may have even called him a genius at one point, then why does society not listen when he talks about nature? (Cushman-Roisin, 2018)

2.1.2.8. Respect for Energy and Natural Resources (Conservation Principle)

Before the discovery of non-renewable sources of energy including coal and fossil fuels, the main source of energy was the sun (Cushman-Roisin, 2018).

According to the author, the amount of solar energy that Earth receives, produces enough energy to meet our electrical demand for 27 years if captured correctly by us. Countries around the world should utilize this information and take it seriously. In recent reports by the *Institute for Energy Economics and Financial Analysis* (Caughill, 2018), China is being praised as the new world leader in renewable energy as it is currently investing in solar panels to obtain renewable energy to fight Climate Change (IEFA, 2018).

Nature provides many other examples of energy concentration and storage (Cushman-Roisin, 2018). This is categorized in three ways, the first being physical processes, the second is biological process and the third is called chemical process. This first process involves hydrologic cycle which provides water elevation creates potential[5] energy and the winds and currents produce kinetic energy[6].

[5] Potential Energy - the energy an object has because of its position relative to another object (Chem Pages, Retrieved, 2018).

[6] Kinetic Energy - is the energy that an object has because of its motion. After we apply this force, energy has been transferred to the object. The energy transferred is what it is called kinetic energy (Khan Academy, Retrieved, 2018).

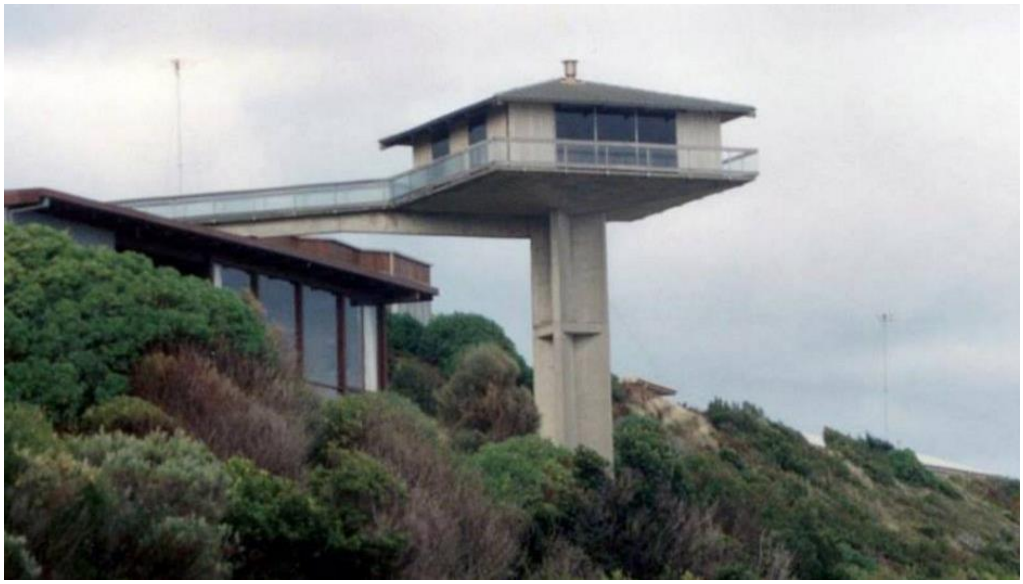
Portugal ran for four days straight on renewable energy alone back in 2016 (Neslen, 2016) and did it again delivering more than 100% of the country's energy in March 2018.
The second example is called biological process which includes the solar energy captured by plant leaves called photosynthesis and also, food concentration which means that higher forms of life eat lower forms.
Moreover, the third example called chemical process involves food calories which have an impact on the ATP (Andenosine Triphosphate) in our bodies- a molecule that fuels life (Robson, 2018).
All these renewable energy resources could be explored further by the humankind had money not have been a major priority. The usage of non-renewable resources such as coal, petroleum, fossil fuels to produce energy leads to the consumption of many more materials than society truly needs and as a consequence the Earth's natural resources are not being used efficiently.

2.1.2.9. Respect for People (Human Vitality Principle)

As technology evolves, the buildings built, the phones created and all the apps that entails, drive us further apart from each other ironically, as social media apps are supposed to push us closer together. We have spent more time by ourselves
now than we have ever before. Sustainable Design, in contrast, aims to create healthy and nourishing places (Cushman-Roisin, 2018).

2.1.2.10. Respect for Place (Ecosystem Principle)

The main sub-principle is how society can adapt to the local environment, where man made products/creations will respect the environment and design without destroying or hurting whatever there is around (Cushman-Roisin, 2018). There can be found architectural infrastructures that meet these standards and blend with the environment in many places, one being the Poll House in the Great Ocean Road in Melbourne, Australia. (figure 10); the Sky Garden House in Singapore (figure 11) and The Fall House in Big Sur (figure 12). These houses are comfortable and lovable while helping to reduce environmental impact.



(From top to bottom)

Figure 10. Pole House. Source: Wiki Arquitectura (Retrieved, 2018)

Figure 11. Sky Garden House. Source: The Good Trade (Retrieved, 2018)

Figure 12. Fall House. Source: The Good Trade (Retrieved, 2018)

2.1.2.11. Respect for Future ("Seven Generations" Principle)

Nature is governed by temporal rates (solar radiation, tree growth, bacterial decay and so on). Everything society does has a consequence in the future. There are multiple ripple effects. What we consume is no longer there for later, unless it is renewable and consumed at a rate below replenishment. Waste has to go somewhere, where it will later have an impact (Cushman-Roisin, 2018).

As clarified in the Indigenous Corporate Training website (2012) The Seventh Generation Principle is based on an ancient Iroquois[7] philosophy that the decisions society makes today should result in a sustainable world seven generations into the future.

[7] Five (later six) Indian tribes across upper New York state during the 17th and 18th centuries (Britannica, 2017).

2.1.3. People, Planet, Profit

According to Alina Wheeler (pg.70, 2009), *People, Planet and Profit* is considered a new business model that represents a fundamental change in how business measures success as making a difference is essential to building a brand.

Over the years, the purpose of having a business relied mainly in creating shareholder value, something that has shifted. The new real meaning of business combines profit with protecting the environment as well as demonstrating care for communities and employees – figure13. Questions such as "*what materials can we use, how do we make it, and how would it be distributed*" (Wheeler, pg. 70, 2009) mean that a radical innovation will have to take place. *The Body Shop* is a rather popular beauty product brand trying to make an environmentally positive impact. Their products are animal cruelty free; ingredients classified as biodegradable are favoured; the brand aims to ensure that their products have a lower water footprint value as well as low eco-toxicity; they strive to increase the levels of ingredients from renewable natural origin; many of their products' ingredients come from "green chemistry" meaning it comes from environmentally friendly processes and techniques that reduce the generation of chemicals which are hazardous to the environment (2018).

Another brand already taking action is *Beyond Meat*. Meat is a big issue when it comes to the environment as animals, specifically cows, release huge amounts of methane into the atmosphere contributing to Climate Change. *Beyond Meat* is responsible for creating meat free burgers that tastes as delicious as an actual beef burger. All of *Beyond Meat's* branding focuses on the good they are doing to both the environment and to their costumer's health. The company combines trendy graphics and appetizing product photos to appeal to how their products are saving the planet as well as improving people's health (DeBara, 2017).

Apple may be the largest technology company and perhaps not the first to appear when thinking about environmentally friendly, however, in 2015, the company signed a nearly $1 billion deal with First Solar which is the largest developer of solar farms in the U.S. Using their technology, *Apple* powers all of its California stores, offices and headquarters

with solar energy. The company also encourages recycling of old or used *Apple* devices and 99% of the paper in their packaging is either recycled or sustainable (DeBara, 2017). Wheeler (2009) claims that a new generation of companies envisions sustainability as the main focus and purpose and that authenticity plays a major role in each company.

Figure 13. Sustainability touchpoints. Source: Wheeler, 2009

Unlike Alina Wheeler (2009), Peter Fisk (2015) goes into much more detail in regards to this business model called *People, Planet and Profit*. He starts off by approaching social and environment issues and saying they make for great profitable growth. Fisk (2015) claims that *People, Planet and Profit* is a practical handbook for CEO's searching for new ways to create value while doing "the right thing". Fisk (2015) lists four main points:

- Profitable growth. Finding new ways to maintain growth in a fast changing world
- Innovation. Connecting capitalism and environmentalism in a positive manner
- Competitive advantage. Putting social and environmental issues at the heart of your business
- Leadership. Inspiring other business by leading by example. Incentive others to rethink, reframe and reinvent.

As the population grows toward 9 billion, major cities such as Mumbai, Los Angeles and Beijing will triple in size (Fisk, 2015). The author stated that whilst the global middle class is the fastest growing section of society, a billion people survive on less than $1 a day and 3 billion on less than $2 a day. 3 billion people have no access to clean water, 800 million are hungry and 10 million children die before they are five – figure 14.

Here are some statistics provided by Fisk (2015):

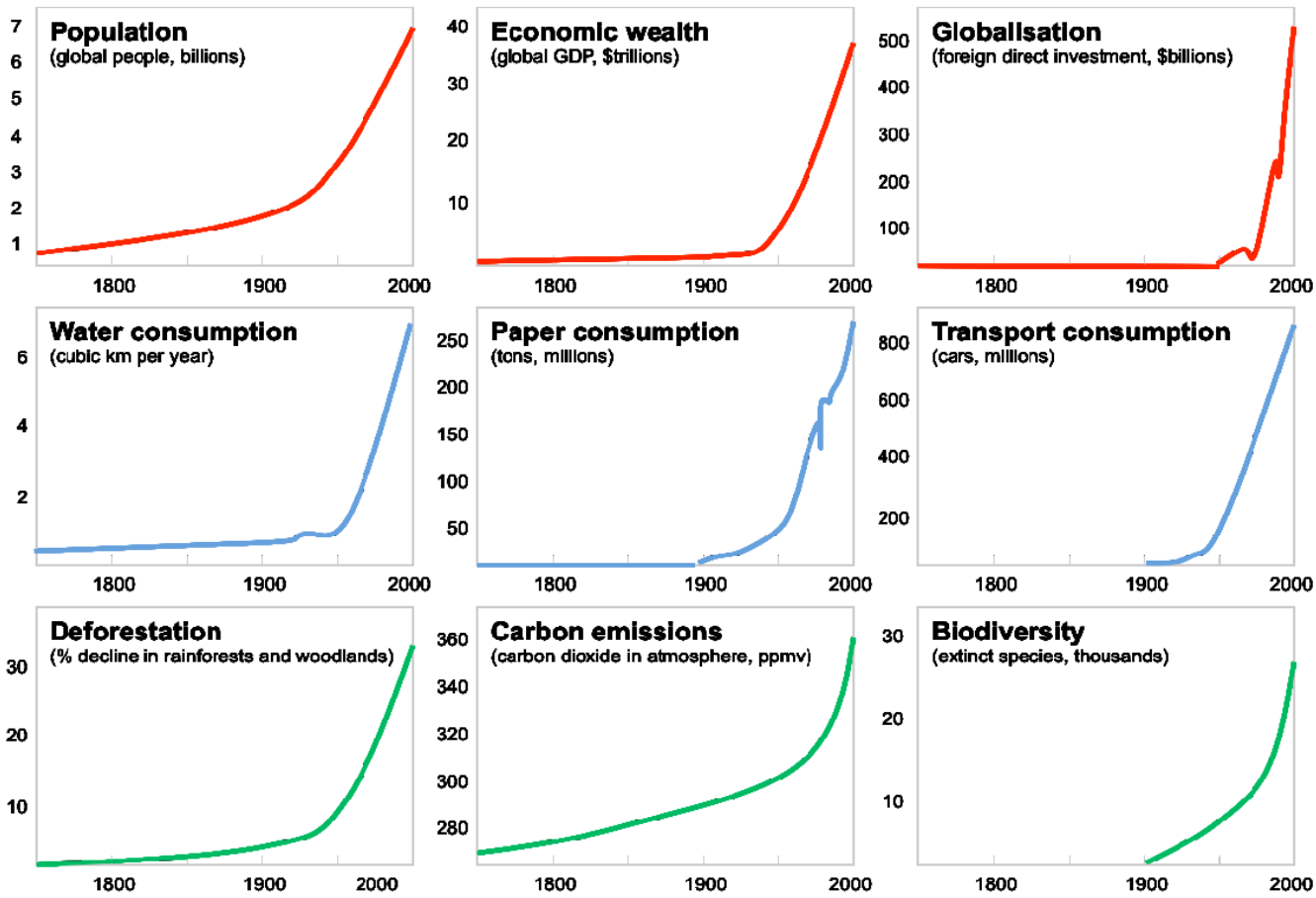


Figure 14. *"World changing: 250 years of population, economic and consumption growth, and the impacts on our environment" (Fisk, 2015).*

Fisk (2015) also claims that people destroy 44 million acres of forest every year, which creates an imbalance in the way nature produces and absorbs carbon dioxide. According to Fisk's research (2015), every year, there is a loss of 100 million acres of farmland, cutting down trees, diverting natural irrigation and creating new deserts around the world. Until 2015 the world had emitted 8 billion tonnes of carbon dioxide into the atmosphere where only 3 billion would be reabsorbed, naturally, by the environment. The author also mentions that people use 160 billion more water than can be restored. It was predicted in October 2017 that Cape Town (South Africa) would run out of water the following March (Chutel, 2018), this day was called *Day Zero*. Quartz (2018) states that in order to calculate *Day Zero*, it was taken into consideration maximum evaporation based on temperature and wind, existing patterns in agriculture and urban use- something considered both natural and man-made. It also states that avoiding *Day Zero*, which has been pushed to 2019, has been a combination of both human effort and rain (Chutel, 2018). At the pinnacle of the crisis, population was under strict restrictions in water usage, only being able to acquire no more than 50 litres of water per day (Chutel, 2018). In Australia, as per *the Australian Government*, water restrictions have been in place for many years due to changing rainfall patterns and drought. Watering the garden and lawn often have time and weekday restrictions. It is advised to wash vehicles with a bucket instead of a hose and preferably washed on the lawn so no water goes to waste. In some areas, it is not allowed for people to wash their cars at home at all having to take it to a commercial area where water is recycled (Government Department of Industry, 2014).

The textiles industry for example, is one that uses vast amounts of water. According to o *Ecotextiles* (2010), most fabric preparation steps involve the fabric having to be washed because of all the chemicals. That same water is often returned to our ecosystem without treatment, that water will make way into our streams and eventually will end up in the ocean, taking all the chemicals with it. As a result of the extreme water usage (Fisk, 2015), 200 million people will become refugees due to flooding and drought if the climate warms by 2-3 degrees by 2050.

Deforestation is another important component to Climate Change. In Indonesia (Before the Flood, 2016), many acres of healthy forest full of animal life, are being taken down to produce palm oil fields. Palm oil is used in basically everything we eat, indisputably being a big source of profit for the industry but harmful not only for wildlife but for the environment as most of the forest is burned down causing massive amounts of CO2 to be released.

Similar to Alina Wheeler's (2009), Fisk (2015) also provides a diagram (figure 15) explaining the *People, Planet and Profit* model.

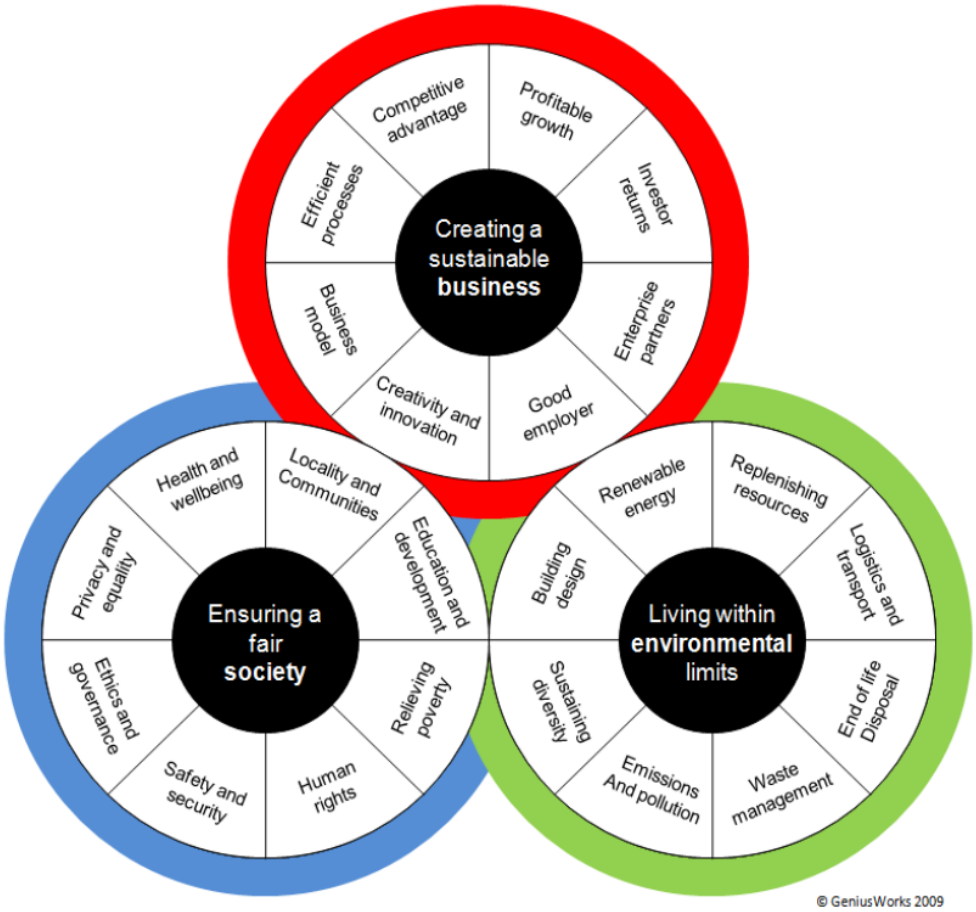


Figure 15. Diagram explaining the *People, Planet, Profit* model. Source: Fisk, 2015

Fisk (2015) states that each colour on their own is not good enough as both people and the environment will always be left lacking. This is a model about rethinking. This model is a more connected approach to business. It demands seeing the bigger picture of why and how society works, finding new perspectives, finding new solutions and new measures of performance. Fisk (2015) also says that it requires us to sometimes connect to competitors as together society can have a greater positive impact.

2.1.3.1. Design as Activism

Max Bruinsma supports some of Wheeler's (2009) perspectives, and has talked about how Designer's and activists have more in common than one would think. In an article by Max Bruinsma called *The Long March* (2004), Bruinsma states that "*real change can be affected by graphic designers who use their work to engage the public in meaningful dialogue*"[8] (2004). Bruinsma (2004) writes about a German student, Dutschke, that in 1968 came up with an idea to go in to the Bastille, behave and then take over. This idea sounded particularly conservative to the young revolutionaries. Dutschke argued that taking the educational, political and trade institutions by force, would amount to heroism in the most ineffective way and so it would be best if the group slowly infiltrated the centres of power from the inside. He did not take into account the young activist spirit of wanting the world and wanting it now. Bruinsma (2004) states that the power has been democratised considerably by the joint forces of social hierarchies and the empowering effects of the media. The average individual in western society has more tools, more platforms and more opportunity to fight for what they think is right. People have to think about how to use these privileges and why. This is where Designers come in.

Back in 1968, Design played an important role, not only in getting the message across that things could be different, but also, getting people to read it and acknowledge it, which as Bruinsma (2004) states, is the first sign of action. The power of imagination has since been immense. In which direction does one allow it to wander, and for what purpose? Is it to sedate citizens or to activate them? According to Bruinsma (2004) this distinction in the

[8] Retrieved from https://www.typotheque.com/articles/the_long_march

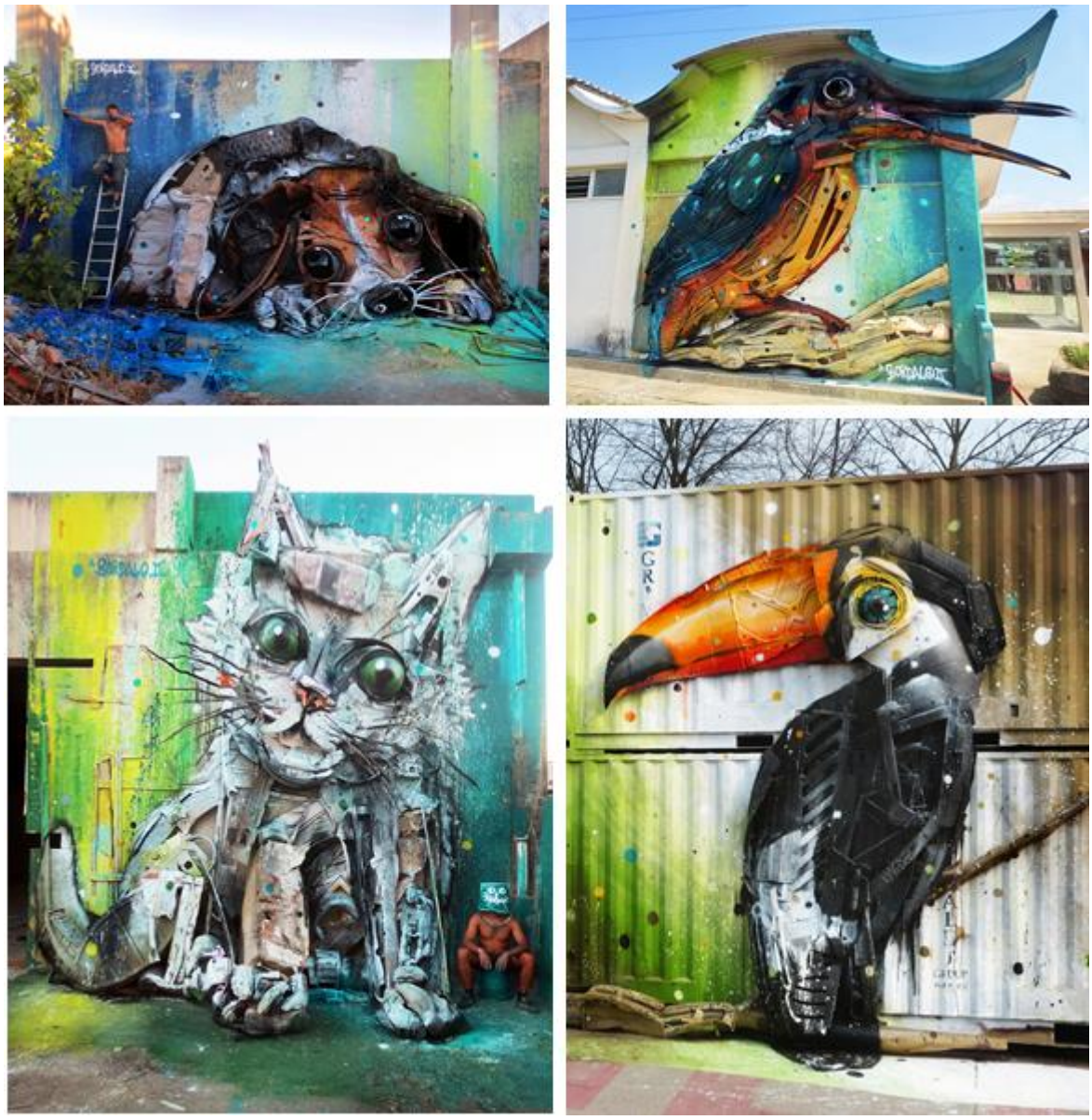
current days, is hard to differentiate. He then gives an example[9]. "*What if Benneton proves to be a serious factor in raising AIDS awareness? What if Greenpeace were successfully selling branded pullovers through a worldwide network of franchising? Whoever thinks consumerism and good causes are incompatible, has a big problem*" (Bruinsma, 2004). In an interview in early 2018 with Camara Arts, Jonathan Barnbrook (2018), who is a graphic designer mentioned that a Designer's job should be to make a world a better place and that all design is political. "*It is very important that Design understands that it has a role to simplify all those complex ideologies into a form that people can understand*".[10] Barnbrook (2018) claimed that to him it is sometimes more important for a Designer to reveal the question instead of having to know all the answers.

Bordallo II (National Geographic 2018) is a Portuguese artist who chooses to focus on trash to raise awareness and cause impact in society, making him not only an artist but also an activist. He creates his artworks from the trash he picks up on the streets to remind society that most objects lose their value rather quickly, makes us think about what people throw out and what could perhaps be avoid altogether. He utilizes mostly plastic, metal and electronic pieces to create three dimensional artworks that speak a thousand words. His most well-known pieces are part of a series called *Big Trash Animals* as shown in figures 16, 17, 18 and 19, and can be seen scattered around the city of Lisbon, Paris among other 20 cities in 3 other countries (National Geographic 2018).

In a rather unlikely Portuguese magazine, Lux, there was a small article (June 2018) about an environmentalist, Julie Church, that collects abandoned flip-flops around the streets and beaches of Nairobi- figure 20. There have been recovered close to 400 tonnes of trash from the ocean thanks to this initiative. *Ocean Sole*, the artisan manufacturing company funding this initiative, works closely with local craftsmen (figure 21) in order to transform these flip-flops into key chains, frames, necklaces, bracelets and beautiful handicrafts (figure 22 and 23), by smoothing out the edges using a lathe (figure 24). *The Guardian* had written and article about the same initiative in 2014, and said that up until that point, about 50 tonnes of flip flops had been turned into pieces of art.

[9] Retrieved from https://www.typotheque.com/articles/the_long_march
[10] Retrieved from https://vimeo.com/257551841

These designers and artists are taking up the role of activists using their knowledge and access to tools to cause people to think about real issues the world is dealing with, weather it is Climate Change, poverty, refugees and so on.



(From left to right and top to bottom)

Figure 16 Dog, Source: Bordalo II (Retrieved, 2018)

Figure 17 Bird, Source: Bordalo II (Retrieved, 2018)

Figure 18 Cat, Source: Bordalo II (Retrieved, 2018)

Figure 19 Toucan, Source: Bordalo II (Retrieved, 2018)

(From top to bottom and left to right)

Figure 20. Flip-Flop in a beach in Kenya. Source: The Guardian, Photograph: Ocean Sole, 2014

Figure 21. In the workshop. Source: The Guardian, Photograph: Ocean Sole, 2014

Figure 22. Elephants on the beach where there were once discarded flip-flops. Source: *The Guardian* Photograph: Ocean Sole, 2014

Figure 23. Giraffe. Source: The Guardian, Photograph: Ocean Sole, 2014

Figure 24. Using a lathe. Source: The Guardian, Photograph: Ocean Sole, 2014

2.1.4. Design Dictionary on Sustainability

The extent to which the designing behind modern societies has failed to deliver ongoing resource efficiency, durability, and flexibility is leading some to believe that *"sustainable design"* is insufficient to fix the problem (Erlhoff & Marshall, p. 380, 2008).

The most commonly cited definition of sustainability is the one put forward in relation to the term "sustainable development" in the 1987 Bruntland Report Our Common Future: meeting the needs of the present without harming the ability of the future generations to meet their needs (Erlhoff & Marshall, 2008, p.380).

Human beings have known for a long time that damaging one species will have serious repercussions on other species and ecosystems. According to *Purakai – Guide to Ocean Health,* scientists in Hawaii have found that tiger sharks have a positive impact on sea grass beds. Turtles are tiger sharks' prey and they spend their time grazing the sea grass bed. In the absence of tiger sharks due to various occurrences such as overfishing, ghost nets, predator depletion; instead of grazing a broader area, turtles will graze the same place of the sea grass bed which will eventually destroy it (*Purakai*).
There is much argument in the philosophical field of *"environmental ethics"* as to why natural ecosystems should be protected from damage: anthropocentric arguments emphasize the dependence of humans on natural ecosystems, "*for example, the Amazon rainforest as the "lungs of the earth" as well as prospective source form cancer cures"*); biocentric arguments emphasize the intrinsic value of nonhuman species (Erlhoff & Marshall, 2008, p.380).

The *Sustainable Design Principles* explained above, can help assist Surf brands on their journey to creating more sustainable and ecofriendly products. The information gathered can provide new ways of thinking and looking at the end goal, further achieving the positive impact desired.

2.1.5. Circular Product Design Model

As Climate Change issues appear, new Sustainable Business Models emerge with them in hopes to create an eco-friendlier future for companies. Ana Mestre and Tim Cooper (2017), two designers and entrepreneurs, teamed up to produce an article about the Circular Product Design Model. Their proposal was based in a conceptual framework for circular product design, based on four multiple loops strategies: *"(I) design to slow the loops"*, *"(II) design to close the loops"*, *"(III) design for bio-inspired loops"*, and *"(IV) design for bio-based loops"* – figure 25 (Mestre & Cooper, 2017).

In their research they discovered that there were gaps and weaknesses in the juridical, business and academic frameworks that are intended to lessen Climate Change consequences. *"Circular"* approaches, both technical and biological, can help redefine those weaknesses by being applied to the different phases of life cycle design. This would play an important role in providing practical guiding strategies for designers.

According to this article (2017), a circular approach is needed at two levels- technical and biological as stated above. These two levels were titled *"Design for a Technical Cycle"* and *"Design for biological Cycle"* (Mestre & Cooper, 2017).

"Design for a Technical Cycle" is the technical use and transformation of material and energy resources as well as their optimisation to the highest possible levels of efficiency. According to the authors, the aim is to minimize material and energy inputs, and emission outputs throughout the whole life cycle of a product or solution, while maximising the highest value proposition for the user. The *"Design for a Technical Cycle"* was subdivided into two strategies – *"slow the loop strategies"* and *"close the loop strategies"* (Figure 25). As explained by Mestre and Cooper (2017), the first strategies encompass slowing material flows in each phase of the life cycle such as design durability and product life extension. *"Close the loop strategies"* imply strategies such as design for recyclability that enables disassembly and appropriate materials selection. The authors highlight the fact that there may be tensions between strategies such as durability and recyclability that need to be addressed.

"Design for a Technical Cycle" (Table 1) solutions can be developed in a short or medium term and implemented within already existing business models, optimising their current efficiency levels.

"Design for a Biological Cycle" (Table 2) consists of *"bio-inspired loop strategies"* and *"bio-based loops strategies"*. The former adopts a biomimetic approach and are long established whereas the latter aim to utilise biological materials that, at the end of their life cycles, can be returned safely to the biosphere.

Mestre and Cooper (2017) give examples following eight *Life Cycle Phases* which they compare to specific products' characteristics for their study:

- Material extraction- selection of low impact materials
- Processing- reduction of material use
- Manufacturing- optimisation of production techniques
- Transportation- optimisation of distribution
- Use- reduction of impact during use
- Product life extension- optimisation of lifetime
- End-of-life disposal- optimisation of end-of-life system
- New concept development

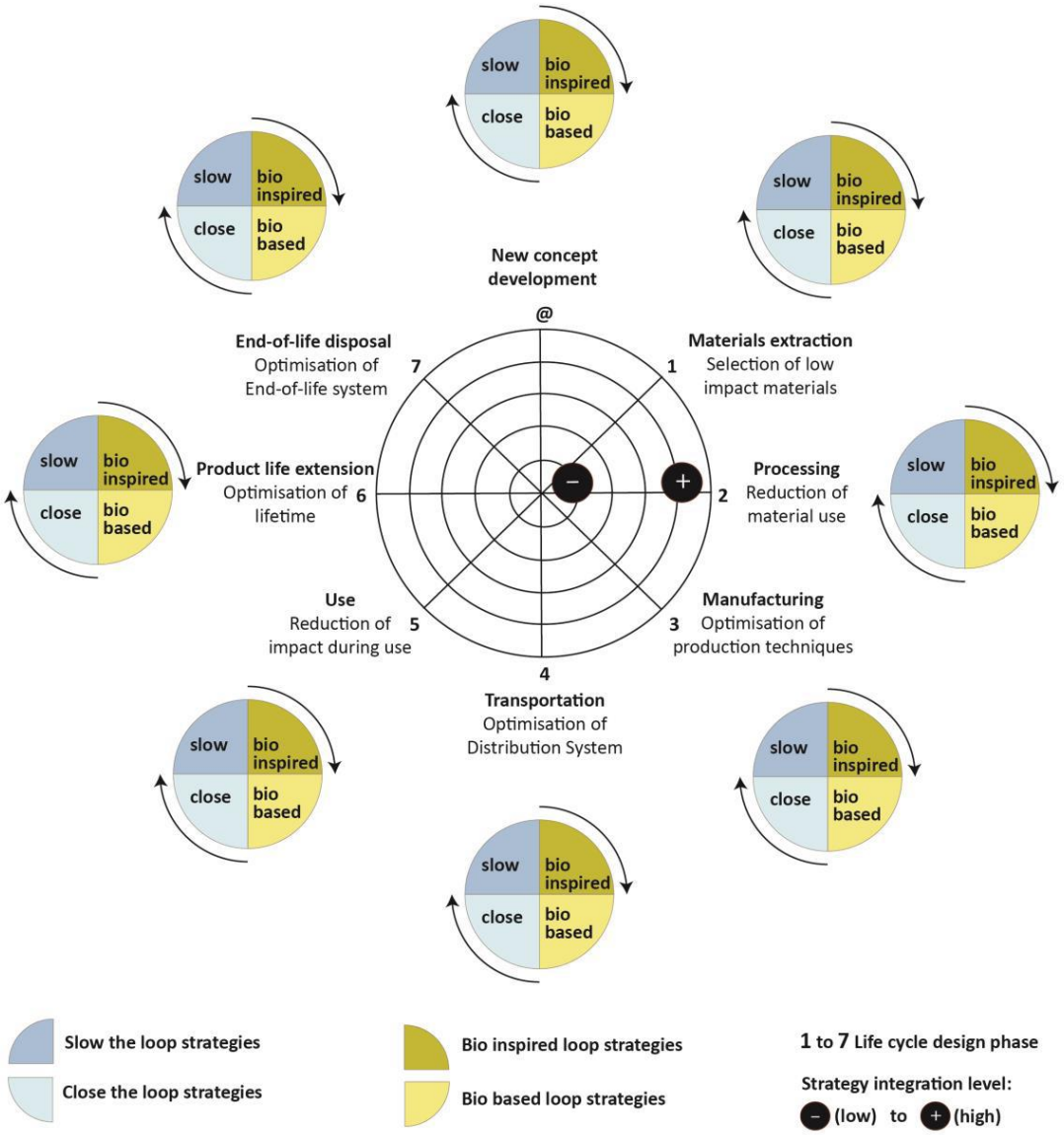


Figure 25. Multiple Loops Life Cycle Design. Source: Mestre & Cooper, 2017

Table 1. Life cycle design strategies to slow the loop and to close the loop – Technical Cycle (Mestre & Cooper, 2017)

Life cycle design Strategies	Slow the loop	Close the loop
1 – Selection of low impact materials	a. Cleaner materials b. Renewable materials c. Lower energy materials d. Recyclable materials	a. Recycled materials b. Recyclable materials c. Biodegradable materials d. Lower energy materials e. Photodegradable materials f. Renewable materials g. Cleaner materials
2 – Reduction of material use	a. Reduction in weight b. Reduction in volume (transport)	a. Reduction in weight b. Reduction in volume (transport)
3 – Optimisation of production techniques	a. Alternative production techniques b. Fewer production steps c. Lower/cleaner energy consumption d. Less production waste e. Fewer/cleaner production consumables	a. Alternative (optimised) production techniques b. Fewer production steps c. Lower/cleaner energy consumption d. Minimal production waste e. Fewer/cleaner production consumables f. Renewable material & energy resources g. Industrial symbiosis
4 – Optimisation of distribution system	a. Less/cleaner/reusable packaging b. Energy-efficient transport mode c. Energy-efficient logistics	a. Less/reusable/ biodegradable (zero waste) packaging b. Energy-efficient transport mode c. Clean & efficient energy logistics d. Elimination of logistics– "do it yourself" (e.g. 3D print at home with starch-based polymers)
5 – Reduction of impact during use	a. Lower energy consumption b. Cleaner energy source c. Cleaner consumables d. Fewer consumables needed e. No waste of energy/ consumables	a. Lower energy consumption b. Clean energy source c. Clean consumables d. Fewer consumables needed e. No waste of energy/ consumables f. Function as service (not product) g. Upgradability (modularity)
6 – Optimisation of initial lifetime	a. Reliability & durability b. Easier maintenance & repair c. Upgradability & adaptability d. Standardization & compatibility e. Modular product structure f. Dis- and reassembly g. Classic design h. Strong product-user relation (e.g. emotionally durable design)	a. Reliability & durability b. Easy maintenance & repair c. Upgradability & adaptability d. Standardisation & compatibility e. Modular product structure f. Dis- and reassembly g. Classic design h. Strong product-user relation i. Service for function maintenance (i.e. company takes back end-of-life product, replaces with new)
7 – Optimisation of end of life system	a. Reuse of product b. Remanufacturing/ refurbishing c. Recycling of materials d. Safer incineration	a. Biodegradability b. Remanufacturing/ refurbishing c. Recycling of materials d. Recollection of product for dismantling/material extraction e. Compostability f. Nutritional value (waste=food) g. Photodegradation

Table 2. Life cycle design strategies for bio inspired loop and for bio based loop – Biological Cycle (Mestre & Cooper, 2017)

Life cycle design strategies	Bio inspired loop	Bio based loop
1 – Selection of low impact materials	a. Bio materials b. Recyclable materials c. Clean materials d. Biodegradable materials e. Photodegradable materials	a. Renewable materials b. Biodegradable materials c. Compostable materials d. Clean materials e. Bio materials f. Photodegradable materials
2 – Reduction of material use	a. Biomimicry & bionics (biological structures) b. Reduction in weight c. Reduction in volume	a. Reduction in weight (less material = less pressure on biological life) b. Reduction in volume (transport)
3 – Optimisation of production techniques	a. Alternative production techniques b. Lower/cleaner energy consumption c. Less production waste d. Fewer/cleaner production consumables e. Industrial symbiosis	a. Alternative production techniques b. Lower/cleaner energy consumption c. Cultivation d. Fewer/cleaner production consumables
4 – Optimisation of Distribution System	a. Less/cleaner/reusable packaging b. Energy-efficient transport mode	a. Bio material packaging b. Energy-efficient transport mode c. Efficient distribution logistics – "grow it yourself" (e.g. mycelium - grow organism at home) d. Elimination of logistics – "do it yourself" (e.g. 3D print in house with starch-based polymers; cultivate material over structure in house; moulding bio waste materials etc.)
5 – Reduction of impact during use	a. Lower energy consumption b. Clean energy source c. Cleaner consumables	a. Clean energy source b. Clean consumables c. Fewer consumables needed d. No waste of energy/consumables
6 – Optimisation of initial lifetime	a. Biomimicry & bionics b. Dis- and reassembly c. Modular product structure (cell-like) d. Self-repair (e.g. self-sealing containers)	a. Reliability & durability (e.g. resistance to biodegradation before desired time) b. Easy maintenance & repair – e.g. self-repair & sustained growth (living materials)
7 – Optimisation of end-of-life system	a. Biodegradability b. Reuse of product c. Repurpose of product function	a. Biodegradability b. Compostable c. Solubility d. Nutritional value (waste=food) e. Compostability f. Photodegradation
@ – Development of new concepts / Product design review / Other design concepts	a. Biodegradability	a. Alternative (biological) production b. Shared cultivation of the material

2.2. Case Studies

2.2.1 Patagonia

After some much needed research, *Patagonia* realized the materials used to make their wetsuit were not ecofriendly. They decided to tackle this concern creating 'green' wetsuits (figure 26) use renewable natural rubber (figure 27) from *Hevea* trees (figure 28) grown in compliance with *Forest Stewardship Council standards*. According to *Patagonia*, the breakthrough material creates 80% fewer CO2 emissions than neoprene, the oil-based synthetic rubber used in most conventional wetsuits. Most wetsuits are made from neoprene which is a petroleum-based compound, harmful to the environment, emitting an excessive amount of CO2 (Burton O. 2017).

"We use limestone-based polychloroprene[11] for most of our neoprene products, and we feel that reducing our dependence on oil and oil-derived chemicals is important. That said, both petroleum- and limestone-based polychloroprene have equally significant environmental impacts, although limestone spills are a lot easier to clean up. (…) It's great that surfers are interested in "green" wetsuits. But limestone doesn't make a wetsuit more environmentally friendly. We really need to push for innovative new materials and construction methods" (Patagonia, 2012).

To fully understand what efforts *Patagonia* is making, it is important to compare the *Sustainable Design Principles* to this case study, giving the opportunity to explore the improvements that could be made to this Surf brand.

Out of the eleven *Sustainable Design Principles* studied in this dissertation, *Patagonia* only meets a few of these principles and most of them are only about half met (table 3). *"Durable Design Solutions"* according to Elemansy (2014), means that *for "a product to be considered zero waste it needs to be either durable to last a lifetime or be fully recycled and transformed into new materials"*. By implementing renewable natural rubber to replace the common neoprene, in theory, their products would last a long time and would be easy to recycle.

[11] Also called neoprene (Britannica, 2015).

By using rubber harvested from *Hevea* trees, *Patagonia* is using *"Nature as Mentor"* as well as *"Respect for Energy and Natural Resources"* (Cushman-Roisin, 2018). It is using nature as a model and learning how to extract and apply natural rubber, which is biodegradable, to their wetsuits while decreasing CO2 emissions.

Patagonia also complies with *"Respect for Future",* another principle according to Cushman-Roisin (2018). One way to respect future generations is leading by example. Right now, finding new and sustainable ways to create products is a big step to make sure younger and future generations have the knowledge to make ecofriendly choices, and also, the eagerness to discover what else they can do to, hopefully, reduce issues that earlier generations did not have the wisdom to tackle.

In a way, this Surf brand follows the *People, Planet, Profit* business model approached by Wheeler (2009) and Fisk (2015) and embraces a few of the main points raised by both authors. The Surf brand innovates responsibly by using natural rubber and limestone to decrease CO2 emissions and increase the use of ecofriendly materials. *Patagonia* takes on leadership by inspiring other brands to follow their example, the brand commits to core values by exploring new sustainable solutions and reduces carbon footprint. Moreover, the Surf brand benefits from profitable growth as it is a respected brand and their wetsuits cost around $200.

Despite *Patagonia*'s efforts, they still have a long road ahead of them to turn their wetsuits into complete *"green"* wetsuits, creating new ways to implement new ecofriendly materials and reduce their carbon footprint. The Surf brand, could also follow a Sustainable Business Model to make it easier to tackle other non-sustainable materials in their products.

(From top to bottom)

Figure 26. Natural rubber wetsuits. Source: Lumberjack (Retrieved, 2018)

Figure 27. Harvesting natural rubber. Source: Patagonia (Retrieved, 2018)

Figure 28. Hevea trees Source: Patagonia Figure (Retrieved, 2018)

2.2.2. Adidas Parley

Adidas has teamed up with *Parley* to avoid plastic residue ending up in the ocean. They intercepted the problem and redesigned their product – figure 29. They recovered plastic bottles from the polluted coastlines before they had a chance to reach the ocean and made sneakers from the plastic- figure 30. The sneakers are made from two plastics: PET, which is the plastic uses in water bottles and nylon from fishermen's nets – figure 31 (Ayres, 2016).

Although this co creation does have a positive impact when it comes to plastic pollution in the Ocean, it also manifests an important question: how is the plastic used being recycled?

In order to be recycled, plastic has to go through a melting process. This process causes VOCs (volatile organic compounds) to be released into the atmosphere which can be harmful to nearby animals, plants. Melting plastic requires heat which generates carbon emissions (Hartman D. 2017).

As it is also stated, plastic resin from petroleum which can contaminate food that is wrapped in recycled plastic (Hartman D. 2017).

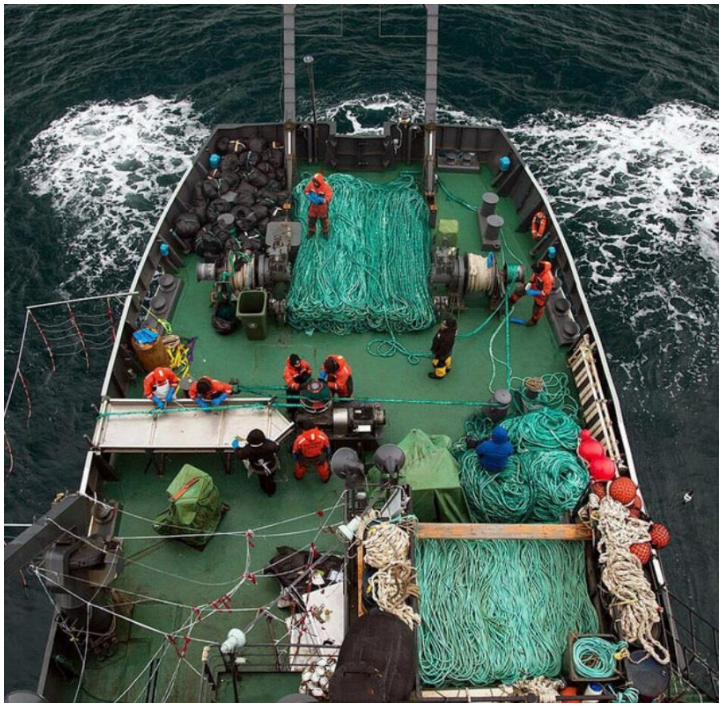
In an interview for the website Core 77 (2016) an *Adidas* and *Parley* collaborator, Alexander Taylor, stated that cleaning the fishing nets for the sneaker was a difficult task as the smell from rotten fish would not come off. The products used to clean both plastic and the fishing nets used, needed strong chemicals to do so.

Recently (2018), *Adidas* in an interview with *The Financial Times* stated that by 2024 all of its products will be made from recycled plastics.

Like *Patagonia, Adidas* complies with a few *Sustainable Design Principles* (table 3) such as *"Durable Design Solutions"* (Elemansy, 2014). By resorting to recycling plastics from coastlines, and since plastic lasts a long time, these sneakers can also last a long time and can be recycled again. The brand also falls into the category of *"Respect for Future"*

(Cushman-Roisin, 2018) as *Adidas* is exploring different ways to recycle plastics and introduce them in their products.
Adidas also respects a few main points in the *People, Planet, Profit* business model (Wheeler, 2009; Fisk, 2015). Just like *Patagonia*, in the co-creation between *Adidas* and *Parley*, they were able to innovate responsibly by collecting lost fishermen's nets as well as many plastic bottles before they reach the sea. On the other hand, in order to melt these plastics, many CO2 emissions are released into the atmosphere, adding to Climate Change. Their leadership is inspiring to other brands that may want to follow their example in recycling plastics found in coastlines and oceans. Moreover, Adidas commits to core values by exploring new sustainable solutions and has great profitable growth as it is a renowned brand and are able to reach consumers with these changes for a reasonable amount.

Collecting plastic bottles and fishnets from the coastlines was a great initiative that, for sure, has inspired many people. Nevertheless, the marketing involving the subject can be misleading as consumers do not have access or thing about what it means to recycle plastics. Consumer's may think that by buying a pair of these particular sneakers, they are making a very sustainable decision, but in fact, they are adding to enormous amounts of CO2 emissions. Although it does relieve the ocean of plastic materials, which is extraordinary, the brand needs to find a new way to do this as well as reduce CO2 emissions, especially if they follow through with the plan to only use recycled plastic materials in all products by 2024. If Adidas explored ways to melt plastic by maybe using *"Renewable Resources"*, the only CO2 emitter would be the plastic, the energy added to make that happen would be sustainable.



(from bottom to top and right to left)

Figure 29. End product. Source: Core 77, 2016

Figure 30. Close-up of recycled material. Source: Core 77, 2016

Figure 31. Raw materials taken from the Ocean. Source: Core 77, 2016

2.2.3. Smartfin- Surfrider Foundation

The *Smartfin* is a surfboard fin with sensors that measure multiple ocean parameters including temperature, location, and wave characteristics – figure 32. Using an app, the data surfers obtain while in the water becomes accessible in near real-time to the scientific community – figure 33. Sensors that measure salinity and pH are still in development (Smartrider Foundation, 2018).

The *Smartfin* is not just about collecting data but also an effort to connect surfers to issues regarding ocean health. Using the data collected with *Smartfin* will give scientists a better understanding about trends and patterns in ocean warming and acidification and prepare communities to take action to tackle problems caused by Climate Change.

Although *Smartfins* are not available for purchase as they are used only by volunteers who sign up to help carry out this investigation, each fin costs roughly 200 US dollars in production and engineering (Smartfin, 2017).

Both *Adidas* and *Patagonia* had similar characteristics regarding *Sustainable Design Principles* but, as the role of the *Smartfin* differs from those two Surf brands and it is not for general use, the principles also vary (table 3).

According to Elemansy (2014), "*Function and Usability"* contributes to the sustainability of a product in an indirect way, helping consumers use the product in a way that consumes less energy. In a way, *Smartfin* follows this principle as the data collected through the fin goes directly to the user's mobile phone app thus consuming as much energy as any other mobile phone app. Something that would perhaps require a boat and many men a few years ago, can now be done by a small fin attached to a surfboard.

As stated by Cushman-Roisin (2018), the main sub-principle is how people and objects can adapt to the local environment. *Smartfin* is the perfect example of an object that respects the environment in the way that it is used. From an outsider's perspective, it is merely a fin attached to a surfboard, behaving like any other fin, helping surfers ride waves without damaging or changing the environment.

Identical to *Adidas* and *Patagonia*, *Smartfin* also follows the *"Respect for Future"* principle in terms of the work it is producing. The data collected through this device will help scientists have a clear understanding of how Climate Change is affecting the Oceans and with understanding comes knowledge. That knowledge might give future generations necessary tools to help protect the Ocean and maybe even regrow species in different and specific conditions.

(From top to bottom)

Figure 32. Smartfin. Source: Smartfin, The Project (Retrieved, 2018)

Figure 33. *Smartfin* App. Source: Smartfin, The Project (Retrieved, 2018)

Table 3. Case Studies

	Patagonia	*Adidas*	*Smartfin*
Form			
Function and Usability			
Cost-Effective Solutions			
Renewable Resources			
Durable Design Solutions	**X**	**X**	
Nature as measure			
Nature as mentor	**X**		
Respect for Energy and Natural Resources	**X**		
Respect for People			
Respect for Place			
Respect for Future	**X**	**X**	**X**
People, Planet, Profit	**X** (a few characteristics)	**X** (a few characteristics)	**X**
Circular Product Design Model			

A comparative table was developed regarding the main sustainable touchpoints present in the brands studied in the case studies. As shown above, each brand only meets a few of these main points. It can also be seen that these three Surf related brands, are very similar in their approach as they mostly touch the same touchpoints – *"Durable Design Solutions", "Respect for Future"* and a few main points of Wheeler (2009) and Fisk's (2015) *People, Planet, Profit* model.

Compared to the other two Surf brands studied above, *Patagonia* intersects more sustainable touchpoints. The Surf brand is clearly making an effort wherever it can, and demonstrating that it is open to explore more of these sustainable touchpoints.

Chapter III - Methodology

3.1. Methodology

In order to carry out this dissertation it is important to conduct a broad qualitative research to cluster various investigation strategies (Bogdan & Bicklen, 1995) about which Surf brands are already executing sustainable methodology to make their products eco-friendlier. It is also important to identify through the literature review which materials these brands were implementing in their products; whether or not those sustainable products are being conducted the correct way.

It is also important understand the positives and negatives of upcycling and/or recycling through literature review. Sometimes these brands try to make a positive impact but end up causing more harm than good as the chemicals needed to alter materials such as plastic, release great amounts of CO2 into the atmosphere (Hartman, 2017). The methods used and the technologies applied to these harmful materials are important when deciding whether or not these brands are, in fact, sustainable.

A further research took place in order to understand to a greater extent these brand's beliefs and if the sustainable methods being applied are as sustainable as primarily thought.

A dissection phase was then reached in order to select valuable information to further conduct this thesis. A comparative study was used to analyse each individual brand and its methods as well as end-products as it is valuable to understand the different approaches these brands take into account.

Case studies allow the exploration and understanding of how Surf brands are committing to sustainability (Zainal, 2007). They were conducted through a comparative table. This visual method helps with crossing information and helps with decision making (Tufte, 2009). Further analysis will then be considered as to whether or not the materials and methods used are being effective.

Data analysis of the collected information throughout this dissertation will then be conducted in order to reach a conclusive result. In addition, the most important topics studied will be summarized in groups to give a simpler overview of the steps Surf brands need to take towards a sustainable approach.

Chapter IV - Data Analysis

4.1. Data analysis

In order to approach the sustainable issue, many Surf brands have been trying to implement new ways to create their end product. Despite their efforts, what they give to the environment, and ultimately to humans, has other negative impacts.
In the future, by following the *Sustainable Design Principles*, Surf brands will have a better and deeper understanding about how they can improve their CO2 footprint as well as what ecofriendly materials can be introduced into their products.

In addition, following a Sustainable Business Model, an opportunity would be given to create a system around their sustainable choices, giving them security and validation as well as help Surf brands introduce renewable and biodegradable materials.

Furthermore, in order to develop a Sustainable Business Model, a few main touchpoints resulting from this dissertation can be outlined:

The *Sustainable Design Principles* to follow are (Elemansy, 2014; Cushman-Roisin, 2018):

- Form
- Function and Usability
- Cost-Effective Solutions
- Renewable Resources
- Durable Design Solutions
- Nature as Measure
- Nature as Mentor
- Respect for Energy and Natural Resources (Conservation Principle)
- Respect for People (Human Vitality Principle)
- Respect for Place (Ecosystem Principle)
- Respect for Future (“Seven Generations” Principle)

People, Planet, Profit (Wheeler, p.90, 2009; Fisk, 2015):

- Creating a Sustainable Business
- Living within Environmental Limits
- Ensuring a Fair Society
- Protect the Environment
- Care for Communities and Employees
- Profitable Growth
- Innovation
- Competitive Advantage
- Leadership

Circular Product Design Model (Mestre & Cooper, 2017):

- Design for Technical Cycle
- Design to slow the loops
- Design to close the loops
- Design for a Biological Cycle
- Design for bio-inspired loops
- Design for bio-based loops
- Material extraction- selection of low impact materials
- Processing- reduction of material use
- Manufacturing- optimisation of production techniques
- Transportation- optimisation of distribution
- Use. Reduction of impact during use
- Product life extension- optimisation of lifetime
- End-of-life disposal- optimisation of end-of-life system
- New concept development

Based on the literature review as well as the case studies above, there is a clear perception that many *Sustainable Design Principles* were not implemented as those Surf brands are not prepared to do so just yet. The changes they are making within their companies as well as the leadership shown will come a long way, step by step.

There was not verified any new contribution for the Sustainable Business Model as the models studied were merely comparative. This study showed that, in theory, there are no new contributions to the Sustainable Business Model. However, when combining all these aspects and characteristics with Surf brands in the real world, new issues may arise and there may have to be implemented new ways to tackled them. It is important to evaluate each model and method implemented as well as the end product and discuss their upsides as well as potential downsides to discover which Sustainable Business Model is best for each Surf brand.

Chapter V – Conclusion and Contributions for Future Investigations

5.1. Conclusion

There is no denying that the Surf brands studied have already started to do the work towards a more sustainable future with some simple yet notable solutions. Throughout this dissertation it was clear that, in the context studied, many of these brands are conscious about the harmful side effects of the usage of plastic and the implications resulted in CO2 emissions. In other words, it was clear that Design can indeed have a positive impact on Climate Change when people come together to understand the real issues and their consequences, when they expand their horizons to other options and solutions.

The *Sustainable Design Principles* (Elemansy, 2014; Cushman-Roisin, 2018) studied, have shed light on what Surf brands can do to improve their products in a much more ecofriendly way. Consequently, Surf brands can approach the sustainable issue slowly but sternly. Moreover, a deep understanding of the different existing sustainable models such as *People, Planet, Profit* made available by Wheeler (2009) and Fisk (2015) as well as *Circular Product Design Model* by the authors Mestre and Cooper (2017), give a clear view on what and how it can be done. Comparing these models can also be insightful as to which one works best in general and also for each brand being discussed and if they could perhaps create their own *Sustainable Business Model* to accommodate their ecofriendly needs.

Although recycling plastics to create *Adidas* sneakers, as seen in the case studies above, might be a long-term solution that is notably helpful to the Oceans, it ends in the release of CO2 emissions (Hartman D. 2017). *Adidas* needs to explore new ways to reduce these CO2 emissions.

Due to the replacement of neoprene with natural rubber, *Patagonia* is reducing harmful materials to the environment and redefining the sustainable path to *"green"* wetsuits (Patagonia, 2012). Products such as *Patagonia "green"* wetsuits can be quite expensive to the ordinary middle class surfer. If these sustainable products were more affordable, perhaps consumers who are used to the easy and expandable solution, would adhere to

sustainable products. One of the reasons why sustainable solutions are expensive, is because not enough brands are choosing sustainable methods, consequently narrowing the consumers' buying options.

As society is now, more than ever, in a consumerist era, it is important for Surf brands to make it clear to consumers why they are making these sustainable changes. Although the Surf brands studied, are taking important steps towards sustainability there needs to be transparency about what still needs to be done in order to achieve positive environmental impacts, reducing plastic materials as well as CO2 emissions. It would be interesting to consider how to implement and merge a sustainable strategy with a business strategy (Larson, 2007). To support this, it would be compelling to understand more about smaller businesses and how they could improve their carbon footprint with new Design concepts and approaches in a comparative way. Replacing plastic altogether with a biodegradable solution is, without a doubt, what would end marine life being killed by plastics and what would benefit out health.

Therefore, a conclusion can be conducted that the hypothesis of this dissertation can be achieved. Although, Surf brands and related businesses should consider conducting further research and development for future implementation plans, in order to achieve positive environmental impacts, reduce plastic materials, and as well as CO2 emissions.

5.2. Contributions for Future Investigations

For future investigations, Surf brands, especially brands related with surfboards, can apply some of the characteristics studied in this dissertation. The *Matta Smartech Eco* surfboard (2018), uses EPS foam and epoxy resin, to leave their positive footprint on the environment. *Vissla* is another Surf brand that produces sustainable wetsuits, board shorts and also holds occasional contests to give people the opportunity to create surfboards from upcycled materials (Vissla, 2018).

In would be interesting to compare the knowledge from this dissertation and these Surf brands for a future investigation on how Surf brands can make a difference and stand up to Climate Change and plastic polluted Oceans.

Chapter VI - Bibliography

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